## AMENDMENTS TO THE CLAIMS

1-18 canceled.

19. (previously presented) An apparatus for evaluating electrical properties of an earth formation surrounding a borehole, the apparatus comprising:

(a) a transmitting antenna assembly o for conveying a radio frequency electromagnetic field into said earth formation; and

(b) a receiving antenna assembly for receiving a signal resulting from interaction of said electromagnetic field with said earth formation;

wherein at least one of the antenna assemblies includes at least one of: (I) a magnetic core formed from a material having high internal magnetostrictive damping, and, (II) low magnetostriction.

20. (previously presented) The apparatus of claim 19 wherein said material has a high internal damping and further comprises a powdered soft magnetic material.

21. (previously presented) The apparatus of claim 20 wherein the powdered soft magnetic material is non-conductive and has a maximum grain size to substantially reduce intragranular power loss at a frequency of said radio frequency magnetic field.

22. (previously presented) The apparatus of claim 20 wherein the powdered soft magnetic material has a maximum grain size less than half a wavelength of an acoustic

wave having a frequency of said radio frequency magnetic field.

23. (previously presented) The apparatus of claim 19 wherein said material has a high internal damping and further has a large area within a hysteresis loop associated with magnetostrictive deformation of the material.

24. (previously presented) The apparatus of claim 20 wherein said at least one antenna core further comprises a non-conductive bonding agent having substantial acoustic decoupling between grains.

25. (previously presented) The apparatus of claim 19 wherein said apparatus is adapted to be conveyed on one of (i) a wireline, and, (ii) a drilling tubular.

26. (previously presented)The apparatus of claim 19 wherein said material has a low magnetostriction and comprises an amorphous metal.

27. (previously presented) A method of determining a resistivity parameter of an earth formation surrounding a borehole, the method comprising:

(a) using a transmitting antenna assembly on a tool conveyed in said borehole for transmitting a radio frequency electromagnetic field into said earth formation;

(b) using a receiving antenna assembly for receiving a signal resulting from

interaction of said electromagnetic field with said earth formation;

(c) using a core for at least one of the antenna assemblies for enhancing the received signals, said core formed from a material having at least one of (I) high internal magnetostrictive damping, and, (II) low magnetostriction.

28. (previously presented) The method of claim 27 wherein said material has a high internal damping, the method further comprising using a powdered soft magnetic material as said material with high internal damping.

29. (previously presented) The method of claim 28 further comprising selecting the powdered soft magnetic material to be substantially non-conductive and having a maximum grain size to substantially reduce intragranular power loss at a frequency of said radio frequency magnetic field.

30. (previously presented) The method of claim 28 further comprising selecting the powdered soft magnetic material as having a maximum grain size less than half a wavelength of an acoustic wave having a frequency of said radio frequency magnetic field.

31. (previously presented) The method of claim 27 wherein said material has high internal damping, the method further comprising selecting said material as having a large area within a hysteresis loop associated with magnetostrictive deformation

of the material.

32. (previously presented) The method of claim 28 further comprising using in said at least one antenna core a non-conductive bonding agent having substantial acoustic decoupling between grains.

33. (previously presented) The method of claim 27 wherein said material has a low magnetostriction, the method further comprising selecting an amorphous metal for use as said material.

34. (previously presented) The method of claim 27 wherein said tool is conveyed into the borehole on one of (i) a wireline, and, (ii) a drilling tubular.

35. (previously presented) An apparatus for evaluating electrical properties of an earth formation surrounding a borehole, the apparatus comprising:

(a) a transmitting antenna assembly for conveying an electromagnetic field into said earth formation; and

(b) a receiving antenna assembly for receiving a signal resulting from interaction of said electromagnetic field with said earth formation;

wherein at least one of said antenna assemblies includes at least one magnetic core formed from a non-ferritic powdered soft magnetic material having high saturation flux density and a non-conductive bonding agent, said magnetic core

having a magnetic permeability $\mu_m$ less than 500 and wherein said saturation flux density is greater than about 0.4 T.

36. (previously presented) The apparatus of claim 35, wherein the magnetic core further comprising dimensions which are related to the direction of an RF magnetic field produced by the transmitter coil and to the magnetic permeability of the powdered soft magnetic material.

37. (previously presented) The apparatus of claim 35 wherein the powdered soft magnetic material is conductive and has a maximum grain size to substantially prevent intragranular power loss of said transmitted electromagnetic signal.

38. (previously presented) The apparatus of claim 35 wherein an effective demagnetizing factor of the magnetic core in a direction of the radio frequency magnetic field substantially exceeds the inverse magnetic permeability of the powdered soft magnetic material.

39. (previously presented)The apparatus of claim 36, wherein the core has an effective permeability, $\mu$, less than 5, as defined by a first equation,

$$\mu = 1 + (\mu_m - 1) / ((\mu_m - 1) \cdot D + 1),$$

wherein D, the demagnetizing factor can be estimated from an elliptic equivalent of the cross-section of the core, as defined by a second equation,